Li-Fraumeni syndrome

Li-Fraumeni syndrome is a rare disorder that greatly increases the risk of developing several types of cancer, particularly in children and young adults.

The cancers most often associated with Li-Fraumeni syndrome include breast cancer, a form of bone cancer called osteosarcoma, and cancers of soft tissues (such as muscle) called soft tissue sarcomas. Other cancers commonly seen in this syndrome include brain tumors, cancers of blood-forming tissues (leukemias), and a cancer called adrenocortical carcinoma that affects the outer layer of the adrenal glands (small hormone-producing glands on top of each kidney). Several other types of cancer also occur more frequently in people with Li-Fraumeni syndrome.

A very similar condition called Li-Fraumeni-like syndrome shares many of the features of classic Li-Fraumeni syndrome. Both conditions significantly increase the chances of developing multiple cancers beginning in childhood; however, the pattern of specific cancers seen in affected family members is different.

Frequency

The exact prevalence of Li-Fraumeni is unknown. One U.S. registry of Li-Fraumeni syndrome patients suggests that about 400 people from 64 families have this disorder.

Genetic Changes

The *CHEK2* and *TP53* genes are associated with Li-Fraumeni syndrome.

More than half of all families with Li-Fraumeni syndrome have inherited mutations in the *TP53* gene. *TP53* is a tumor suppressor gene, which means that it normally helps control the growth and division of cells. Mutations in this gene can allow cells to divide in an uncontrolled way and form tumors. Other genetic and environmental factors are also likely to affect the risk of cancer in people with *TP53* mutations.

A few families with cancers characteristic of Li-Fraumeni syndrome and Li-Fraumeni-like syndrome do not have *TP53* mutations, but have mutations in the *CHEK2* gene. Like the *TP53* gene, *CHEK2* is a tumor suppressor gene. Researchers are uncertain whether *CHEK2* mutations actually cause these conditions or are merely associated with an increased risk of certain cancers (including breast cancer).

Inheritance Pattern

Li-Fraumeni syndrome is inherited in an autosomal dominant pattern, which means one copy of the altered gene in each cell is sufficient to increase the risk of developing

cancer. In most cases, an affected person has a parent and other family members with cancers characteristic of the condition.

Other Names for This Condition

- LFS
- Sarcoma family syndrome of Li and Fraumeni
- Sarcoma, breast, leukemia, and adrenal gland (SBLA) syndrome
- SBLA syndrome

Diagnosis & Management

These resources address the diagnosis or management of Li-Fraumeni syndrome:

- GeneReview: Li-Fraumeni Syndrome
  https://www.ncbi.nlm.nih.gov/books/NBK1311
- Genetic Testing Registry: Li-Fraumeni syndrome
  https://www.ncbi.nlm.nih.gov/gtr/conditions/C0085390/
- Genetic Testing Registry: Li-Fraumeni syndrome 1
  https://www.ncbi.nlm.nih.gov/gtr/conditions/C1835398/
- Genetic Testing Registry: Li-Fraumeni syndrome 2
  https://www.ncbi.nlm.nih.gov/gtr/conditions/C1836482/
- MedlinePlus Encyclopedia: Cancer
  https://medlineplus.gov/ency/article/001289.htm
- National Cancer Institute: Genetic Testing for Hereditary Cancer Syndromes
  https://www.cancer.gov/about-cancer/causes-prevention/genetics/genetic-testing-fact-sheet

These resources from MedlinePlus offer information about the diagnosis and management of various health conditions:

- Diagnostic Tests
  https://medlineplus.gov/diagnostictests.html
- Drug Therapy
  https://medlineplus.gov/drugtherapy.html
- Surgery and Rehabilitation
  https://medlineplus.gov/surgeryandrehabilitation.html
- Genetic Counseling
  https://medlineplus.gov/geneticcounseling.html
- Palliative Care
  https://medlineplus.gov/palliativecare.html

Additional Information & Resources

MedlinePlus

- Encyclopedia: Cancer
  https://medlineplus.gov/ency/article/001289.htm
- Health Topic: Bone Cancer
  https://medlineplus.gov/bonecancer.html
- Health Topic: Breast Cancer
  https://medlineplus.gov/breastcancer.html
- Health Topic: Cancer
  https://medlineplus.gov/cancer.html
- Health Topic: Soft Tissue Sarcoma
  https://medlineplus.gov/softtissuesarcoma.html

Genetic and Rare Diseases Information Center

- Li-Fraumeni syndrome
  https://rarediseases.info.nih.gov/diseases/6902/li-fraumeni-syndrome

Additional NIH Resources

- National Cancer Institute: Childhood Cancers
  https://www.cancer.gov/types/childhood-cancers
- National Cancer Institute: Genetics of Breast and Ovarian Cancer
  https://www.cancer.gov/types/breast/hp/breast-ovarian-genetics-pdq

Educational Resources

- Disease InfoSearch: Li-Fraumeni syndrome 1
  http://www.diseaseinfosearch.org/Li-Fraumeni+syndrome+1/8745
- Disease InfoSearch: Li-Fraumeni syndrome 2
  http://www.diseaseinfosearch.org/Li-Fraumeni+syndrome+2/8746
- MalaCards: li-fraumeni syndrome
  http://www.malacards.org/card/li_fraumeni_syndrome
- My46 Trait Profile
  https://www.my46.org/trait-document?trait=Li-Fraumeni%20syndrome&type=profile
- Orphanet: Li-Fraumeni syndrome
  http://www.orpha.net/consor/cgi-bin/OC_Exp.php?Lng=EN&Expert=524
- Stanford Cancer Center
  https://stanfordhealthcare.org/medical-conditions/cancer/li-fraumeni-syndrome.html

Patient Support and Advocacy Resources

- American Cancer Society
  http://www.cancer.org
- CureSearch (the Children's Oncology Group and the National Childhood Cancer Foundation)
  http://curesearch.org/
- National Coalition for Cancer Survivorship
  http://www.canceradvocacy.org

GeneReviews

- Li-Fraumeni Syndrome
  https://www.ncbi.nlm.nih.gov/books/NBK1311

Genetic Testing Registry

- Li-Fraumeni syndrome
  https://www.ncbi.nlm.nih.gov/gtr/conditions/C0085390/
- Li-Fraumeni syndrome 1
  https://www.ncbi.nlm.nih.gov/gtr/conditions/C1835398/
- Li-Fraumeni syndrome 2
  https://www.ncbi.nlm.nih.gov/gtr/conditions/C1836482/

ClinicalTrials.gov

- ClinicalTrials.gov
  https://clinicaltrials.gov/ct2/results?cond=%22Li-Fraumeni+syndrome%22

Scientific articles on PubMed

- PubMed
  https://www.ncbi.nlm.nih.gov/pubmed?term=%28Li-Fraumeni+Syndrome%5BMAJR%5D%29+AND+%28Li-Fraumeni+syndrome%5BTIAB%5D%29+AND+english%5Bla%5D+AND+human%5Bmh%5D+AND+%22last+1800+days%22%5Bdp%5D

OMIM

- LI-FRAUMENI SYNDROME 1
  http://omim.org/entry/151623
- LI-FRAUMENI SYNDROME 2
  http://omim.org/entry/609265

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  Free article on PubMed Central: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1735082/

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